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(54) Title: INTERACTIVE MASCARA BRUSH 2

(57) Abstract: An interactive mascara applicator (10) comprising: a handle end portion (40); an opposite bristle/brush end portion (80); and a rotating disc (50) positioned about the handle end portion (40) which when moved causes the bristles to change positions with respect to the applicator (10), so that one may hold the handle end portion (40) and move the disc (50) with a single hand to apply mascara.

Interactive Mascara Brush²**Background - Field of Invention**

5 This invention relates to an *interactive* mascara applicator where one aspect comprises; a handle end portion; an opposite brush end portion having bristles; and a rotating *sphere* or *disc* positioned about the handle end portion which when moved causes the bristles to *change position* with respect to the applicator, so that one may hold the handle end portion and move
10 the *sphere* with a single hand to apply mascara.

Description of Prior Art

The conventional mascara applicator has a handle located at its top end, a brush located at its
15 bottom end, and a rod located in between the two, connecting the handle with the brush. The handle is used for gripping and maneuvering the entire assembly while the brush is used for stroking and coating the lashes.

The brush section of most commercial mascara applicators are fixed and permanently attached to
20 the rod however, there have been some brush sections shown in the prior art that are adjustable. For example in U.S. patent number 4,446,880 to Gueret & Arraudeau, and patent numbers 3,998,235 and 5,137,038 to Kingsford, several makeup brushes are described where the bristles within the brush section are adjustable by either changing their immediate spacing, overall diameter, or initial curvature.

25 In each of the prior art patents disclosed, adjustments to the brush section are shown to occur only *prior* or *subsequent to* the actual application. In other words, a user must stop, pre-select the desired adjustment position, and then proceed with using the brush. *Further, both hands must be used to make adjustments to the brush.*

30 In my previous patent 5,937,871, an interactive mascara brush is disclosed where the bristles within its brush section can be adjusted at *any time* by using *the finger of a single hand*. In one

embodiment, an applicator is described where its brush section is capable of rotating. However, the number of times that the brush section can rotate, and the degree to which the brush section can achieve a full turn is limited by the inherent restrictions associated with the physical size of the internal parts being used within the assembly.

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Objects and Statement of Invention

Accordingly, the advantages of my invention are to disclose an applicator where the brush section can freely rotate. A further advantage is to disclose an applicator where the shape of the brush section and/or the bristle alignment within the brush section can be interactively altered.

These advantages are achieved according to the invention in that the applicator assembly has a rotating sphere or disc located about the assembly's handle end section. When the sphere is moved (*turned*), the bristles within the brush section react immediately by changing their alignment, shape, or by causing the entire brush section to rotate. In other words, the rotating sphere creates an interactive relationship between a user's operational commands and the derivative positioning of the bristles within its brush section. All adjustments are optional and can be performed at *any time* by using *the finger of a single hand*. In addition, the brush section is an expandable sleeve that fits like a glove over the bottom end of the applicator rod and is replaceable.

An interactive approach is defined as a two way mechanical communication system that involves *little or no* time delay between a mechanical action that gets performed by a user and a reciprocal mechanical reaction that results from the issued operational command. This approach allows a user to engage in and choose from an array of bristle arrangements all without having to stop in the middle of the application process to perform any additional adjustments.

The effect of an "interactive" approach is twofold. First, *by giving the bristle's of the brush the capability to be altered in "real time" - during the actual application of the makeup to the lashes, and by using the finger of a single hand*, allows changes in combing or stroking patterns to be immediate and direct resulting in no delays during application. This is especially convenient since most mascara formulas today dry quickly once they get exposed to air.

Second, the *amount* or *level* of “mechanical adjustment” that occurs among the bristles of the brush, or to the number of times that the brush section rotates is directly controlled by the user.

Further objects and advantages of my invention will become apparent from a consideration of
5 the drawings and ensuing description.

Brief Description of the Drawings

Figure 1 shows an internal view of an interactive mascara applicator that enables the brush section to freely rotate. A rotating disc positioned within the handle end section is mainly responsible for accomplishing this task.

Figures 1A, 1B, and 1C show internal views of alternate interactive approaches for allowing the brush section to rotate. Figure 1A uses an external ring, figure 1B a rotating sphere, and figure 1C uses a set of dials.

Figure 2 shows an internal view of a mascara applicator that interactively enables a user to change the alignment of the bristles within its brush section.

Figure 2A shows an internal view of an *alternate* interactive approach that allows changes to the alignment of the bristles within a brush section.

Figure 3 shows an internal view of an interactive mascara applicator with mechanisms that enable the shape of the brush section to change.

Figure 4 shows an internal view of an applicator's handle end section. A *catch and release* pin is located inside which helps to control the brush section's degree of rotation and re-positioning of its internal rod.

Drawing Reference Numerals

10	Interactive Mascara Brush/Applicator	130	Internal Dial
20	Screw	140	Spring
5	30 Stationary Bar	150	Applicator Rod with Grooves
40	Handle End Section/Applicator Cap	160	Rotating Bar
50	Rotating Disc	170	Rotating Bar Compartment
60	Applicator Housing / Frame	180	Sleeve Pin
70	Applicator Rod	190	Stretchable / Deformable Brush Sleeve
10	80 Brush Section	200	Applicator Rod Corridor with Internal Grooves
90	Sphere	210	Piston
100	Internal Ring	220	Fill Material
110	External Ring	230	Catch and Release Pin
120	External Dial	240	Passageway having Bottom End Side Orifice

Description - Figures 1 to 4

Figure 1 shows an internal view of an interactive mascara applicator 10 with a mechanism that allows rod 70 and brush 80 to freely rotate. Screw 20 attaches the top end of handle 40 to a first end of stationary bar 30. A second end of stationary bar 30 is connected to a first side of disc 50 where disc 50 is rotatably mounted. A second side of disc 50 is fixed to a first end of rod 70. A second end of rod 70 is fixed to a first end of brush 80. The framework outlining handle 40 forms housing 60 and extends to cover a portion of rod 70. Housing 60 also forms a window within handle 40 so that a section of disc 50 is externally exposed.

Figure 1A shows an inside view of handle end 40. Internal ring 100 is attached and rotatably mounted throughout an opening arranged around the internal wall of housing 60. The outer edge of ring 100 is exposed through this opening and is attached to one side of external ring 110 so that movements that occur to ring 110 can be mimicked by ring 100. External ring 110 is attached and rotatably mounted around the outside surface of handle 40. One side of internal ring 100 is fixed to a first end of rod 70 by way of screw 20.

Figure 1B shows an inside view of handle 40 where sphere 90 is rotatably mounted inside. Screw 20 attaches the top end of handle 40 to a first end of stationary bar 30. A second end of stationary bar 30 is connected to a first opening within sphere 90 where sphere 90 is rotatably mounted. A second opening within sphere 90 is fixed to a first end of rod 70 so that when sphere 90 turns, rod 70 also turns. The framework outlining handle 40 forms housing 60 and extends to cover a portion of rod 70. Housing 60 also forms a window within handle 40 so that a section of sphere 90 is externally exposed.

Figure 1C shows an internal view of handle 40 where external dial 120 is used to initiate the rotation of rod 70. Screw 20 attaches the top end of handle 40 with a first end of stationary bar 30. A second end of stationary bar 30 is connected to a first side of internal dial 130, where internal dial 130 is rotatably connected. A second side of dial 130 is fixed to a first end of rod 70 so that when dial 130 moves, rod 70 also moves. External dial 120 is positioned perpendicular to internal dial 130 where the teeth located on both dials (120 & 130) communicate with each other. The framework outlining handle 40 forms housing 60 and

extends to cover a portion of rod 70. Housing 60 also forms a window within handle 40 so that a portion of the teeth located on dial 120 can be exposed.

Figure 2 shows an internal view of an interactive mascara applicator 10 that enables a user to change the alignment of the bristles within its brush section 190. Applicator rod 150 is positioned within handle 40 where its top end is fixed to a first side of spring 140. A second side of spring 140 is connected to a top portion of handle 40 by screw 20. The rest of rod 150 extends through housing 60 where it is slidably positioned. One end of the extended portion of housing 60 is fixed to one side of pin 180. A stretchable/deformable sleeve 190 covers the bottom portion of rod 150 and is releasably attached to a second side of pin 180. The framework outlining handle 40 also forms compartment 170 where bar 160 is located. Rotating bar 160 is positioned relative to rod 150 in a manner that allows the grooves located on both to freely communicate.

Figure 2A shows an internal view of an alternate interactive approach that varies the length of an applicator's internal rod so that the bristle alignment within its brush section can be modified (*bristles are not shown in this figure*). Screw 20 attaches the top end of handle 40 with a first end of stationary bar 30. A second end of stationary bar 30 is connected inside a first opening of sphere 90, where sphere 90 is rotatably mounted. A second opening within sphere 90 has grooves located at its entrance. Rod 150 also has grooves located on its surface which permit it to attach itself and move back and forth within sphere 90. Housing 60 extends to form corridor 200 at a lower section of handle 40. Corridor 200 surrounds rod 150 and has grooves located within it that help facilitate and support rod 150's movement in and out of sphere 90.

Figure 3 shows an internal view of an interactive mascara applicator 10 with mechanisms that enable the shape of its brush section 190 to change. Screw 20 attaches the top end of handle 40 to a first end of spring 140. A second end of spring 140 is attached to the top end of rod 150. The bottom end of rod 150 is attached to one side of piston 210. The framework outlining handle 40 forms housing 60 and a passageway 240 for rod 150 and piston 210 to snugly travel through. A bottom area of passageway 240 has an orifice located on its side that forms a curvature. Fill material 220 is located inside passageway 240, below piston 210. Deformable brush sleeve 190 covers passageway 240's side orifice and mimics its curvature shape until it

attaches to a first side of pin 180. A second side of pin 180 is attached to the external side of passageway 240. The framework outlining handle 40 also extends to form compartment 170 where bar 160 is located and permitted to freely rotate without becoming displaced. Rotating bar 160 is positioned relative to rod 150 in a manner that allows the grooves located on both to
5 freely communicate.

Figure 4 shows an internal view of handle 40 with a *catch and release* pin 230 located inside. Screw 20 attaches the top end of handle 40 to a first end of stationary bar 30. A second end of stationary bar 30 is connected to one side of disc 50 where disc 50 is rotatably mounted. A
10 second side of disc 50 is fixed to rod 70. The framework outlining handle 40 forms housing 60 and extends to cover a portion of rod 70. On the inside of housing 60, *catch and release* pin 230 is attached and extends outward in a direction that permits its outer edge to contact the grooves located on disc 50.

Operation - Figures 1 to 4

In figure 1, an interactive mascara applicator 10 is shown with a mechanism that allows rod 70 and brush section 80 to freely rotate. Housing 60 forms a window that allows a section of disc 50 to be exposed, such that when disc 50 is turned (*using one finger of a single hand*), both rod 70 and brush section 80 mimic its movement by also turning. Disc 50 does not get displaced within handle 40 because screw 20 securely fastens one end of stationary bar 30 to the top end of handle 40. A second end of stationary bar 30 rotatably mounts disc 50 where disc 50 freely rotates.

Figure 1A shows a different interactive approach that allows rod 70 and brush section 80 to freely rotate (*brush section 80 is not shown in this figure*). External ring 110 is rotatably mounted around handle 40, and located in an area on the surface of housing 60 where one finger of a single hand can turn it. By turning external ring 110, internal ring 100 moves with it in the same direction and at the same speed. Rod 70 is able to mimic the movement of internal ring 100 because its top end is fixed to ring 100 by way of screw 20.

Figure 1B shows another interactive approach that allows rod 70 and brush section 80 to freely rotate (*brush section 80 is not shown in this figure*). A section of sphere 90 is exposed through a window formed by housing 60 such that when one finger of a single hand turns it, rod 70 mimics its movement by also turning. Sphere 90 does not get displaced within handle 40 because screw 20 securely fastens one end of stationary bar 30 to the top end of handle 40.

Figure 1C shows a further interactive approach that allows rod 70 and brush section 80 to freely rotate (*brush section 80 is not shown in this figure*). A section of external dial 120 is exposed through a window formed by housing 60 such that when one finger of a single hand turns it, rod 70 mimics its movement by also turning. This happens because of the way in which rod 70 is fixed to one side of internal dial 130 *and* the manner in which the teeth on dial 130 get displaced by the teeth of dial 120. Internal dial 130 remains in place within handle 40 because screw 20 securely fastens one end of stationary bar 30 to the top end of handle 40.

Figure 2 shows an internal view of an interactive mascara applicator 10 that enables a user to change the alignment of the bristles within brush 190 by turning bar 160.

When bar 160 is turned in a first direction (*by using one finger of a single hand*), the grooves located on its surface come into contact with the grooves on rod 150. This causes rod 150 to become displaced and to move further inside sleeve 190. Subsequently, sleeve 190 expands and stretches, separating its bristles further apart and changing their alignment. Simultaneously, spring 140 stretches.

The distance that rod 150 moves determines the amount of separation that will occur between the bristles on sleeve 190.

When bar 160 counter-rotates, spring 140 flexes back and helps facilitate the movement of rod 150 out of sleeve 190 so that the bristles can return to their initial alignment. The distance that bar 160 rotates in a first direction represents an array of possible distances or positions that rod 150 can stop at and occupy. Each of these positions represent various spacing changes for the bristles on sleeve 190. Whenever a user desires a particular bristle alignment, bar 160 is rotated and held at that particular point. Pin 180 serves to attach sleeve 190 to housing 60. Screw 20 serves to anchor spring 140 to the internal wall of handle 40. Compartment 170 allows bar 160 to rotate without becoming displaced.

Figure 2A shows an internal view of an alternate interactive approach that varies the length of rod 150 so that the bristle alignment within its brush section can be modified (*brush section is not shown in this figure*).

A section of sphere 90 is exposed through a window formed by housing 60 such that when one finger of a single hand turns it, rod 150 moves further inside sphere 90 and thereby decreases the length of rod 150 inside corridor 200. Corridor 200 has internal grooves located inside that serve to stabilize and facilitate rod 150's movement in and out of sphere 90. Sphere 90 does not get displaced within handle 40 because screw 20 securely fastens one end of stationary bar 30 to handle 40's top end.

Figure 3 shows an internal view of an interactive mascara applicator 10 with mechanisms that enable the shape of its brush section 190 to change.

When bar 160 is rotated in a first direction (*by using one finger of a single hand*), the grooves located
5 on its surface come into contact with the grooves on rod 150. This causes both rod 150 and piston 210 to become displaced and to move further down inside passageway 240. As this movement occurs, it causes filler material 220 to be pushed further inside sleeve 190 resulting in a change in sleeve 190's curvature. Simultaneously, spring 140 stretches. The distance that bar 160, rod 150 and piston 210 move determines the amount of fill material 220 that will be
10 displaced into sleeve 190 and sleeve 190's derivative curvature shape.

When bar 160 counter-rotates, spring 140 flexes back and helps facilitate the movement of rod 150 and piston 210 out of passageway 240. This causes filler material 220 to return to its initial disbursement pattern. The distance that bar 160 is rotated represent an array of possible
15 distances or positions that rod 150 can stop at and occupy. Each of these positions represent a different curvature for sleeve 190. Whenever a particular curvature shape is desired, bar 160 is rotated and held at that point. Pin 180 serves to attach sleeve 190 to housing 60. Screw 20 serves to anchor spring 140 to the internal wall of handle 40 and compartment 170 allows bar 160 to rotate without becoming displaced.

20 In figure 4, a *catch and release* pin 230 is shown whose function is to regulate the re-positioning of applicator rod 70. Housing 60 forms a window that allows a section of disc 50 to be exposed, such that when disc 50 is turned (*using one finger of a single hand*), rod 70 mimics its movement by also turning. Disc 50 does not get displaced within handle 40 because screw 20
25 securely fastens one end of stationary bar 30 to the top end of handle 40. A second end of stationary bar 30 rotatably mounts disc 50 where disc 50 freely rotates. As disc 50 rotates, its grooves come into contact with the outer edge of *catch and release* pin 230. Each of the contact points slow the rotation of disc 50 so that one may re-position rod 70 more easily. Catch and release pin 230 also serves to control the degree of rotation that rod 70 will
30 experience.

Summary, Ramification, and Scope

An interactive approach allows a user to engage in and choose from an array of bristle arrangements and brush shapes all without having to stop in the middle of the application process to perform any adjustments. A rotating disc, ring, sphere, and a set of dials (*rotational gear*) are generally located about an assembly's handle end section. When one of the rotational gear pieces is engaged (*turned*), the bristles on the brush interactively and immediately respond. This reaction changes either the bristle alignment, brush section shape, or causes the brush section to freely rotate.

The effect of an "interactive" approach is twofold. First, *by giving the bristle's of the brush the capability to be altered in "real time" - during the actual application of the makeup to the lashes*, allows changes in combing or stroking patterns to be immediate and direct resulting in no delays during application. This is especially convenient since most mascara formulas today dry quickly once they get exposed to air. Second, the *amount* or *level* of "mechanical adjustment" that occurs either among the bristles of the brush, or to the degree that the brush section rotates is directly controlled by the user.

Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention.

Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by just the examples giving.

Claims: I claim:

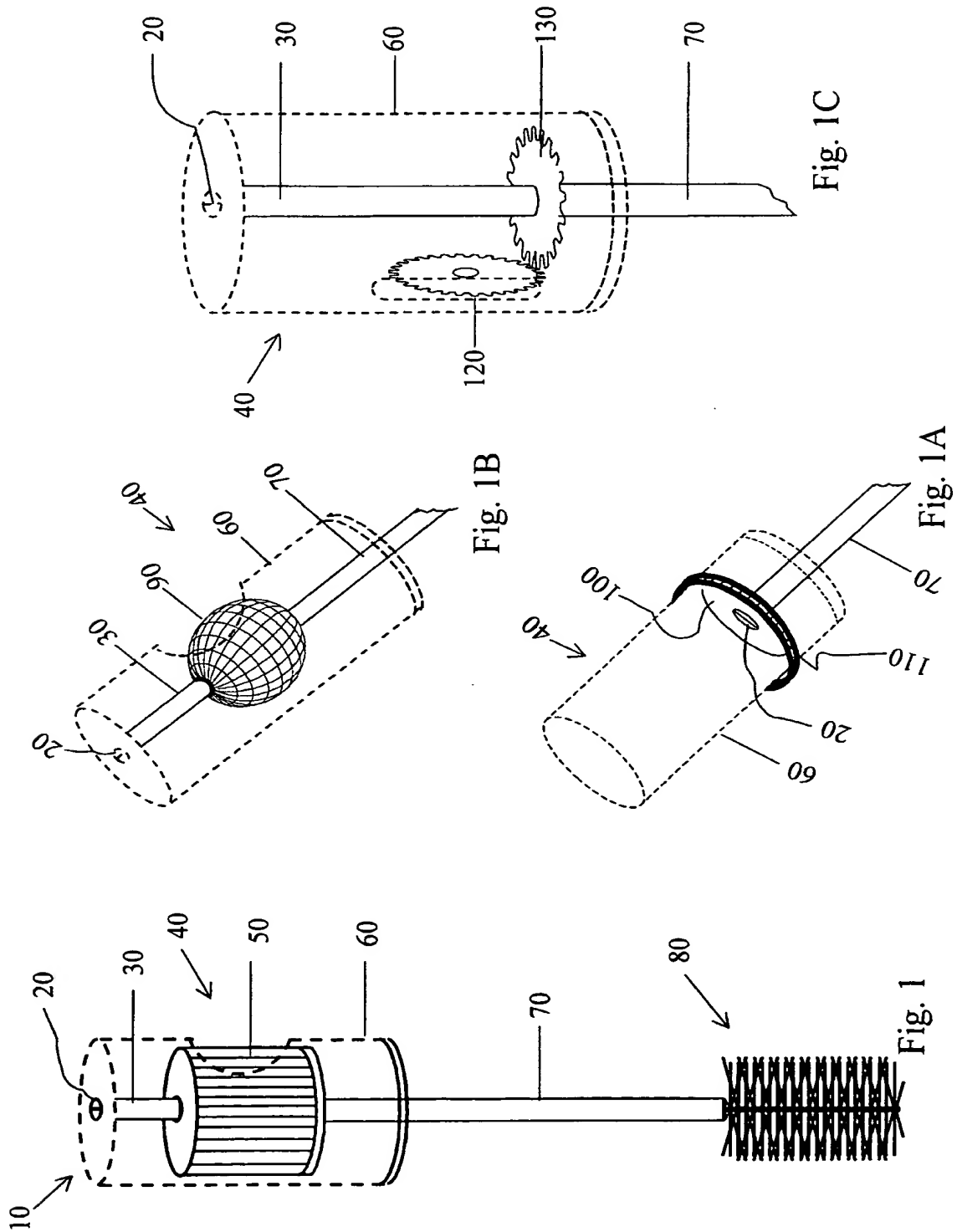
- 1) A mascara applicator of the type having a handle end portion and an opposite bristle end portion having bristles, wherein the improvement comprises:
5 a rotational body positioned about the handle end portion which when moved causes the bristles to change position with respect to the applicator, so that one may hold the handle end portion and move the rotational body with a *single hand* to apply mascara.
- 10 2) An applicator as in claim 1 wherein the rotational body is a disc which rotates a longitudinal rod when the disc is turned.
- 3) An applicator as in claim 2 wherein the bristles are rotated when the rod is rotated.
- 4) An applicator as in claim 1 wherein the rotational body is a sphere which rotates a longitudinal rod when the sphere is turned.
- 15 5) An applicator as in claim 4 wherein the bristles are rotated when the rod is rotated.
- 6) An applicator as in claim 1 wherein the rotational body is an external ring which rotates an inner ring when the external ring is turned.
- 7) An applicator as in claim 6 wherein a longitudinal rod rotates when the inner ring is rotated.
- 8) An applicator as in claim 7 wherein the bristles are rotated when the rod is rotated.
- 20 9) An applicator as in claim 1 wherein the rotational body is an external dial which rotates an inner dial when the external dial is turned.
- 10) An applicator as in claim 9 wherein a longitudinal rod rotates when the inner dial is rotated.
- 11) An applicator as in claim 10 wherein the bristles are rotated when the rod is rotated.
- 12) An applicator as in claim 1 wherein the rotational body is a bar which contacts a portion of a
25 sliding rod configured so that when the bar is turned, the rod slides within the applicator.
- 13) An applicator as in claim 12 wherein the bristles are configured so that they move when the bar turns and the rod slides.
- 14) An applicator as in claim 13 configured so that when the bar turns, the rod slides towards the bristle end portion of the applicator and the bristles are separated.
- 30 15) An applicator as in claim 14 wherein the bristles are arranged on an expandable sleeve.

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- 16) An applicator as in claim 1 wherein the rotational body is a sphere which contacts a portion of a moving rod configured so that when the sphere is turned, the rod moves within the sphere.
- 17) An applicator as in claim 16 wherein the bristles are configured so that they move when the sphere turns and the rod moves.
- 18) An applicator as in claim 17 configured so that when the sphere turns, the rod moves towards the bristle end portion of the applicator and the bristles are separated.
- 19) An applicator as in claim 18 wherein the bristles are arranged on an expandable sleeve.
- 20) An applicator as in claim 12 wherein an end of the sliding rod comprises a piston which moves a "filler material" which causes the bristles to move.
- 21) An applicator as in claim 16 wherein an end of the moving rod comprises a piston which moves a "filler material" which causes the bristles to move.
- 22) An applicator as in claim 13 configured so that when the bar is turned, the rod slides towards the handle end portion of the applicator and the bristles are squeezed together.
- 23) An applicator as in claim 17 configured so that when the sphere is turned, the rod moves towards the handle end portion of the applicator and the bristles are squeezed together.
- 24) An applicator as in claim 1 wherein a *movement regulating member* is additionally positioned about the handle end portion, configured so as to control the degree of rotation and movement of the bristles.

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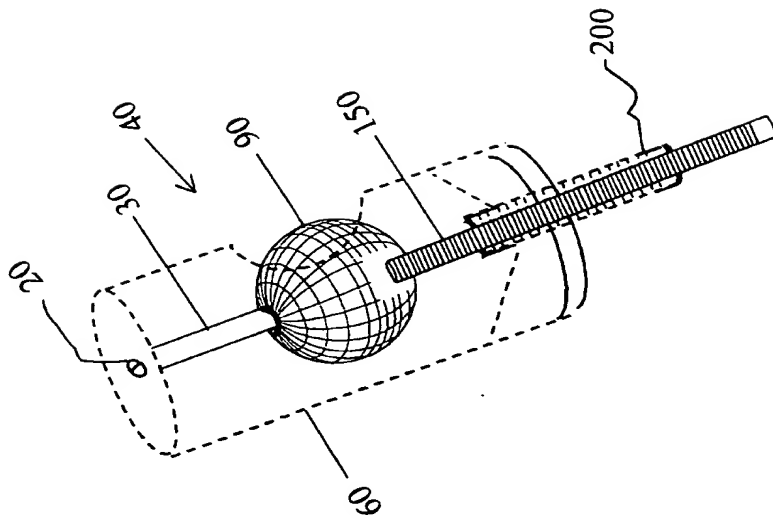
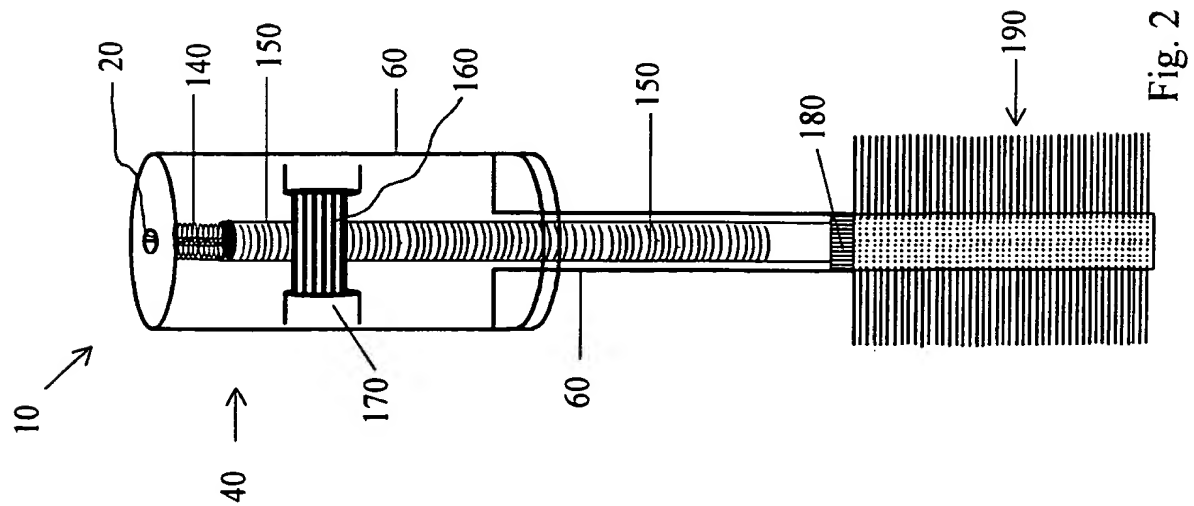
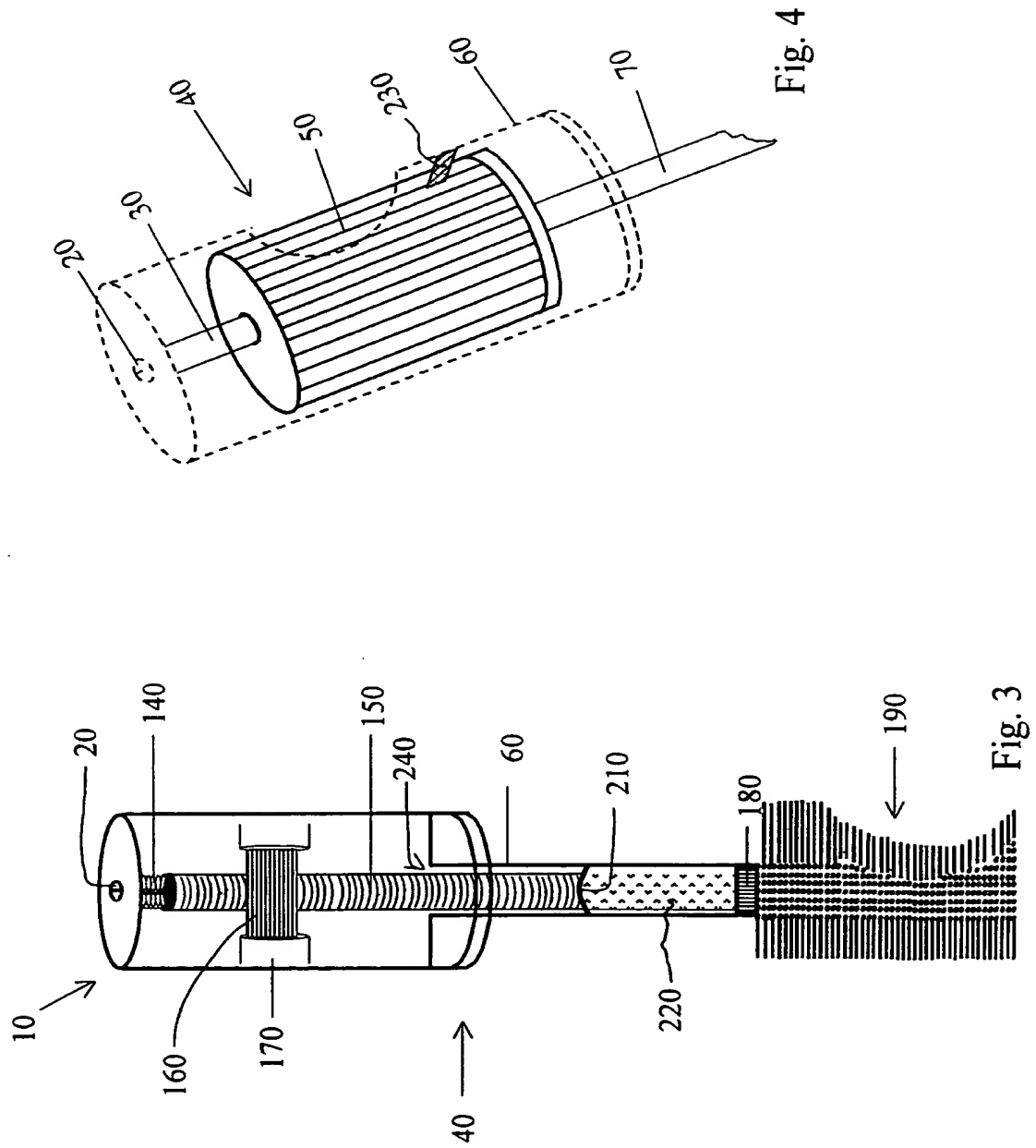


Fig. 2A

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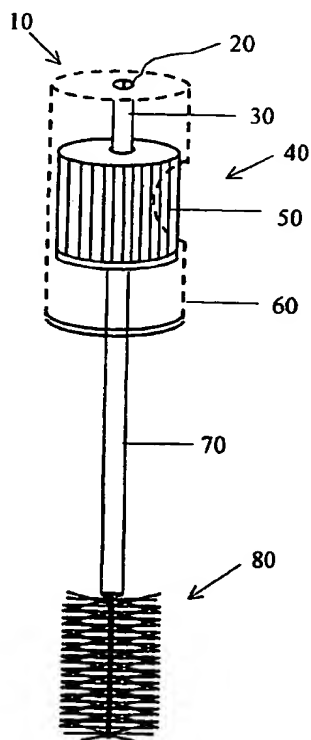
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(54) Title: INTERACTIVE MASCARA BRUSH 2



(57) Abstract: An interactive mascara applicator (10) comprising: a handle end portion (40); an opposite bristle/brush end portion (80); and a rotating disc (50) positioned about the handle end portion (40) which when moved causes the bristles to change positions with respect to the applicator (10), so that one may hold the handle end portion (40) and move the disc (50) with a single hand to apply mascara.



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B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 132/218, 317, 318, 320 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,446,880 A (GUERET et al) 08 May 1984, figs. 1-2, whole document	1-3
A	US 5,937,871 A (CLAY) 17 August 1999, fig. 2, whole document	1-24
A	US 4,687,364 A (KINGSFORD) 18 August 1987, whole document	1-24
A	US 4,744,377 A (DOLAN) 17 May 1988, whole document	1-24
A	US 5,027,838 A (IAIA et al) 02 July 1991, whole document	1-24
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Date of the actual completion of the international search 26 APRIL 2001		Date of mailing of the international search report 14 MAY 2001
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